



## ENVIRONMENTAL LEARNING PROGRAMS CELEBRATE WILDFLOWERS

### #10 POLLINATORS

<b>CONTENT</b>	Different colors and shapes of flowers are pollinated by different pollinators.
<b>GRADE LEVEL</b>	K-6
<b>OBJECTIVES</b>	Observe interaction between flowers and pollinators.
<b>PROCESS AND RESEARCH SKILLS</b>	Observation, comprehension, application, analysis.
<b>PRODUCT</b>	Drawing of wildflowers and their pollinators.
<b>SUGGESTED LOCATION</b>	Among wildflowers in their native habitat or in a garden full of flowers.
<b>TIME REQUIRED</b>	30 minutes to one hour.
<b>MATERIALS</b>	Paper and pencil, wildflower and native plant field guides, field glasses, and newspaper article, "Flower Determines Honey's Taste."
<b>BACKGROUND</b>	<p>Many flowers need pollen from other flowers to produce seeds, but flowers cannot move. So they have developed a clever scheme for attracting bees, butterflies, hummingbirds, bats, beetles, ants, and in some parts of the world - mosquitoes to carry pollen to other flowers. Bees probably are the most frequent pollen carriers.</p> <p>Flowers attract pollinators by their flower color, fragrance, or nectar. Bees can perceive the colors in the yellow, blue, and ultraviolet spectrum of light, but they cannot see colors in the red spectrum. Hummingbirds can see reds and oranges.</p> <p>Clearly marked or shaded areas near the center of some flowers guide bees and other pollinators to the nectar, a sweet liquid secreted by the flower. To reach the nectar, pollinators must crawl over the pistil and anthers to reach into the flower's heart. In doing so, the pollinators deposit and pick up pollen and transfer it from flower to flower.</p>



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#### BACKGROUND CONTINUED

The "mouth-tongue" proboscis of bees enables them to suck up the nectar. Bees can taste sweet, bitter, sour, and salty flavors. They can also taste with their front legs and antennae.

Flowers send messages with their fragrances. Bees are enticed more by the flowers' smells than by their colors and shapes.

Some flowers smell like rotting flesh. These plants, such as Polemonium (Jacob's Ladder) and Veratrum (Skunk Cabbage), attract pollinators such as flies, which feed on dead and putrefying flesh.

The petals of some flowers are modified to help pollination. Some flowers have a lip-like shape that provides a landing place for bees. Bumblebees, which are heavier, can open a snapdragon's (Antirrhinum) "mouth", but a honeybee is too light.

Bees carry pollen from flower to flower, pollinating the flowers and making fruit and seed production possible. Thus, the bee and the flower work together.

Flowers have evolved many other ways to attract pollinators or discourage unwanted visitors. For example, flowers that are pollinated by night-flying bats and moths have white or light-colored petals and produce heavy evening fragrances that attract these nocturnal pollinators. Some flowers stay closed at certain times during the day, making their nectar unavailable to undesirable insects.

Other flowers, like those in the Morning Glory Family (Convolvulaceae), open early in the morning and close about midday to accommodate the working hours of their pollinators.

#### CAUTION

Be aware of safety when around stinging insects.

1. Bees or wasps are not interested in humans until struck at or startled by sudden movements. Simply move away slowly with your head down.
2. Colors and scents attract insects. Wear subdued colors, not bright colors or black. Don't wear perfumes, hair sprays, lotions, and other scented items that might attract insects.
3. Wear long sleeves and pants to protect you from nettles, grassburrs, and insects.



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#### CAUTION CONTINUED

4. Ward off flying insects with insect repellents safe for humans.
5. Ask parents of children allergic to stings to provide appropriate medication in case children are stung.

#### ACTIVITY AND DISCUSSION

1. Find a spot where you can see a variety of flowers.
2. Spend 15 to 20 minutes quietly sitting still and watching.
3. Take brief notes on the interactions you observe between flowers and pollinators.
4. Discuss your observations as a group. How long did the insects spend at each flower? What did the insects do while visiting the flower?
5. Draw color pictures of your observations.

#### EVALUATION

Field notes and accuracy of drawing.

#### EXTENSION 1

Did you know?

The largest flower in the entire plant kingdom is a parasite that grows on the roots of a vine in the dense tropical forest of Sumatra. The flower, which has been measured at 1.4 meters in diameter, was discovered in 1818 by a botanist. The plant has an awful odor of decay and feces.

Predict what the pollinators are for this giant flower? (Flies)

#### EXTENSION 2

Determine the significance of the weight of pollinators.

Materials: Large flowers, sticky clay.

1. Have students roll small balls of clay into an assortment of sizes. The balls represent insects of different sizes.
2. Starting with the smallest ball, place them on/in the flowers to mimic insects pollinating stigmas. Repeat until the flower collapses and can no longer support the weight of the balls.
3. Repeat this with other flowers.
4. Which flower could support the largest ball of clay? List some insects which could pollinate these flowers. Which flowers supported the least amount of weight? These flowers must have small pollinators or be pollinated by wind. List some insects that could serve as pollinators for these flowers.
5. Can you think of a flower that might require a heavy or strong pollinator to get the flower open? (A rose, delphinium, others.)